



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/055,164

10/29/2001

Wade W. Smith

WMS-15

9573

7590

05/19/2005

Spencer T. Smith  
53 Silver Brook Lane  
North Granby, CT 06060

EXAMINER

BORISSOV, IGOR N

ART UNIT

PAPER NUMBER

3639

DATE MAILED: 05/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.



UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents  
United States Patent and Trademark Office  
P.O. Box 1450  
Alexandria, VA 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

**MAILED**

**MAY 19 2005**

**GROUP 3600**

**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/055,164  
Filing Date: October 29, 2001  
Appellant(s): SMITH, WADE W.

\_\_\_\_\_  
Spencer T. Smith  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 3/18/2005

AL

2

**(1) *Real Party in Interest***

A statement identifying the real party in interest is contained in the brief.

**(2) *Related Appeals and Interferences***

The brief does not contain a statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief. Therefore, it is presumed that there are none. The Board, however, may exercise its discretion to require an explicit statement as to the existence of any related appeals and interferences.

**(3) *Status of Claims***

Claims 1 and 4 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Longini (US 4,509,679) in view of Proffitt et al. (US 5,415,024) and further in view of Official notice. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Longini in view of Proffitt further in view of Official Notice and further in view of Saar et al. (US 6,430,514). Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

**(4) *Status of Amendments After Final***

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) *Summary of Invention***

The summary of invention contained in the brief is correct.

Art Unit: 3639

**(6) Issues**

The brief does not contain a statement identifying the issues. However, on pages 5 and 6 of the Appeal brief the Applicant argues that:

- 1) Proffitt (US 5,415,024) is not relevant to Claim 1;
- 2) Unlike Longini and Proffitt, which measure flow at the device, Claim 1 measures the square root of the change in pressure across the heat transfer device.

**(7) Grouping of Claims**

The brief contains a statement identifying Claim 1 being the only Claim argued as representative of Claims 1 and 4.

**(8) Claims Appealed**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(9) Prior Art of Record**

US 4,509,679      Longini

US 5,415,024      Proffitt et al.

**(10) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Longini (US 4,509,679) in view of Proffitt et al. (US 5,415,024) and further in view of Official Notice.**

**As per claims 1 and 4,**

Longini teaches an energy use monitoring system within an apartment unit, including a pump with known flow and pressure characteristics (column 3, lines 38-39), digital thermometers installed upstream and downstream the apartment (column 2, lines 41-44), a digital flow meter (column 2, line 29), and a microprocessor with build in relationship between pressure and flow, and known flow and pressure characteristics of the pump (column 3, lines 40-41, 55-60); wherein a quantity of energy used by each apartment unit is proportional to the volume of fluid received, which is metered by change in flow, multiplied by the temperature difference between the received and the returned water (column 1, lines 54-62). The readings for each unit are accumulated over time, suggesting the identification of each unit (column 1, lines 63-64). Furthermore, Longini teaches a digital pressure meter used for measuring the difference in pressure produced by the pump, said pressure meter is utilized to increase the accuracy of measurement and calculations (column 3, lines 41-60).

However, Longini does not specifically teach a pair of pressure transducers to be connected proximate the upstream and downstream the apartment for supplying pressure data to the microprocessor. Also, Longini does not specifically teach that computation of energy use, which is conducted by multiplying the change in flow by the

Art Unit: 3639

temperature difference between the received and the returned water, includes a multiplication of square root of change in pressure by said temperature difference.

Proffitt et al. (Proffitt) teach an apparatus for analysis of multiphase fluid by measuring an energy input and heat loss from the apparatus, comprising an insulation (18), pressure and temperature sensors disposed upstream and downstream from insulation (18) for continuously computing a change in pressure and temperature, and a controller to which the input of measurements are directed (column 3, lines 55-column 4, lines 25; column 9, lines 5-7). Furthermore, Proffitt teaches that use of said apparatus allows accurate calculation of characteristics of multiphase fluid through application of the ideal gas laws and thermodynamic principles (column 4, lines 22-39).

Official notice is taken that it is well known from thermodynamic principles that flow (in conduits) is proportional to the square root of the pressure change across it controlling flow impedance.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Longini to include a pair of pressure transducers to be connected proximate the upstream and downstream of the heat exchange device, as disclosed in Proffitt, and include that that computation of energy use is conducted by multiplying a square root of change in pressure by said temperature difference, because it would advantageously increase the accuracy of energy used measurement. As per *first* and *second* computational means, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Longini in view of Proffitt et al. and further in view of Official Notice to include

Art Unit: 3639

a plurality of computational means, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

**Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Longini in view or Proffitt further in view of Official Notice and further in view of Saar et al. (US 6,430,514).**

**As per claim 3**, Longini, Proffitt and Official Notice teach all the limitations of claim 3, except that the serial number of the heat transfer device is transmitted.

Saar et al. teach a water management system for an apartment including a number of water consuming devices each equipped with flow and temperature metering monitors, wherein each monitor transmits a data package to a host computer, said data package including a serial number (column 2, lines 2-4).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Longini, Proffitt and Official Notice to include that the serial number of the heat transfer device is transmitted to a host computer, as disclosed in Saar et al., because it would advantageously enhance the accuracy of volumetric calculations in water monitoring systems.

***Allowable Subject Matter***

Art Unit: 3639

**Claim 2** is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

**Claim 2.** Longini, Proffitt and Official Notice teach an energy use monitoring system within an apartment unit comprising pressure and temperature sensors disposed upstream and downstream from a heat transfer device for computing a change in pressure and temperature, and a programmable logic controller to which the input of measurements are directed.

However, Longini and Proffitt do not teach means for multiplying the accumulated computed square root of the change in pressure times the change in temperature by:

a. the time duration between the periodic multiplying of the square root of the change in pressure times the change in temperature,

b. 8.33, and

c. a constant defined by dividing a flow rate by the square root of the pressure drop across the heat transfer device for the flow rate defined in a manufacturer's catalog for that heat transfer device.

## **(11) Response to Argument**

**11.1** The Applicant argues that Proffitt is not relevant to the Claim 1.

In response to said argument, the examiner points out that Claim 1 recite a system for monitoring the use of heat energy, including pressure/temperature



Art Unit: 3639

transducers placed upstream and downstream of heat exchange device for supplying pressure and temperature data to computational means.

Proffitt teaches an apparatus for analysis of multiphase fluid by measuring an energy input and heat loss from the apparatus, including pressure and temperature sensors disposed upstream and downstream from insulation (18) (heat exchange device), for providing pressure and temperature data to a controller (column 3, lines 55-column 4, lines 25; column 9, lines 5-7). Furthermore, Proffitt specifically teaches that use of said apparatus includes measuring an energy input and heat loss from the apparatus with application of the ideal gas laws and thermodynamic principles (column 4, lines 22-39). Therefore, the examiner stipulates that Proffitt is relevant for the Applicant's invention.

**11.2** The Applicant argues that unlike Longini and Proffitt, which measure flow at the device, Claim 1 measures the square root of the change in pressure across the heat transfer device.

In response to said argument, the examiner asserts that it is well known from thermodynamic principles that flow (in conduits) is proportional to the square root of the pressure change across it controlling flow impedance. This fact is well established in the art and has been numerously documented. As an example, the following references explicitly teach that the flow through an orifice of constant area is proportional to the square root of the pressure drop across the orifice:

US 3,645,094	(C. 2, L. 20-27)
US 3,672,401	(C. 1, L. 40-44)

Art Unit: 3639

US 3,690, 341	(C. 2, L. 54-57)
US 3,731,876	(C. 1, L. 20-23)
US 3,750,710	(C. 2, L. 30-41)
US 4,779,631	(C. 8, L. 64-68)
US 5,323,657	(C. 28, L. 50-55)
US 5,352,213	(C. 10, L. 40-44)

Furthermore, Longini specifically teaches a microprocessor with build in relationship between pressure and flow (column 3, lines 40-41, 55-60).

Therefore, the examiner stipulates that teachings of Longini, specifically, calculating a quantity of energy used by each apartment by measuring change in flow multiplied by the temperature difference between the received and the returned water (column 1, lines 54-62), said calculation been performed by the microprocessor with build in relationship between pressure and flow, is equivalent to recited in Claim 1 calculation the square root of the change in pressure across the heat transfer device.

For the above reasons, it is believed that the rejections should be sustained.

Art Unit: 3639

Respectfully submitted,

Igor Borissov

IB

May 12, 2005

Conferees

John Weiss *JW 5-16-05*

Thomas Dixon *TD 5-16-05*

Spencer T. Smith  
53 Silver Brook Lane  
North Granby, CT 06060